

**A SEX-LINKED RECESSIVE CHARACTER FOR MELANISM IN
THE MOTH *ECLIPTOPERA SILACEATA* (D. & S.)
(LEPIDOPTERA: GEOMETRIDAE)**

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IN MAY OF 1970 I spent a short holiday in Devon and one evening, on returning to the house where I was staying, I noticed a female of the Small Phoenix moth *Ecliptopera silaceata* (D. & S.) resting on the wall of the porch where it had been attracted by the electric light. I boxed it and left it overnight. The next morning I examined it and as it was apparently a perfectly normal female, it was released. It had, however, laid eighteen eggs in the box, and I decided to rear these on my return home.

When hatching occurred the young larvae were started off on leaves of rose bay *Chamaenerium angustifolium* (L.) which they attacked with relish, and in due course I had eighteen healthy pupae. When emergence started, the first two to emerge were normal in appearance and the following morning, to my delight, I saw the bilateral gynandromorph mosaic, depicted on plate E, drying its wings. During the next few days the emergence was complete, and I had thirteen apparently normal males, the gynandromorph and four females, two of which were the dark form shown on the plate.

The four females were paired and eggs were obtained from all pairings. In due course the larvae were seen to be developing inside the eggs. Unfortunately those from the dark females, although fully developed, failed to hatch, and those from the normal females produced only apparently normal individuals, which on interbreeding for a further two generations, failed to provide any more of the dark variety.

The above results indicate that the factor for the production of the dark colouring is probably a sex-linked recessive carried on the X chromosome. If we use X for the normal chromosome and X" for the varietal chromosome then the genetic constitution of the original female would be (XY) since the (XX) condition is the male in the Lepidoptera. This female then, had paired with an unknown male with the constitution (X"X) and which would have been normal in appearance. The offspring of this pairing would produce four genotypes in equality as follows:

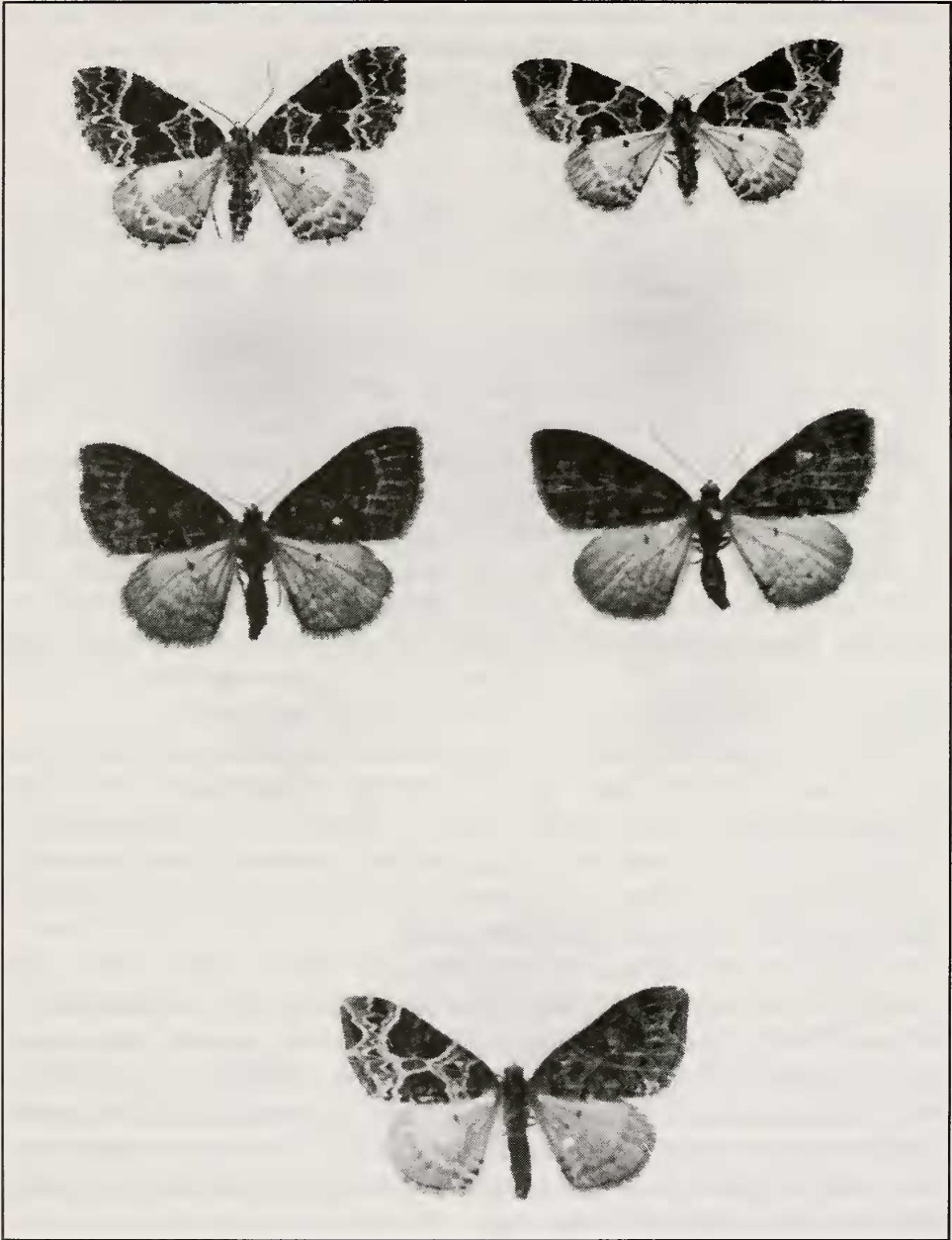
XX = Normal male

XY = Normal female

X"X = Male carrier

X"Y = Dark variety female

The gynandromorph was formed from an egg which should have produced a male carrier (X"X), normal in appearance, but at the first division of the zygote the normal X chromosome was lost from the right-hand cell leaving an individual in which the left half had the male carrier constitution (X"X) and was therefore normal in appearance, whilst the right half had the



Top left: Normal female

Top right: Normal male

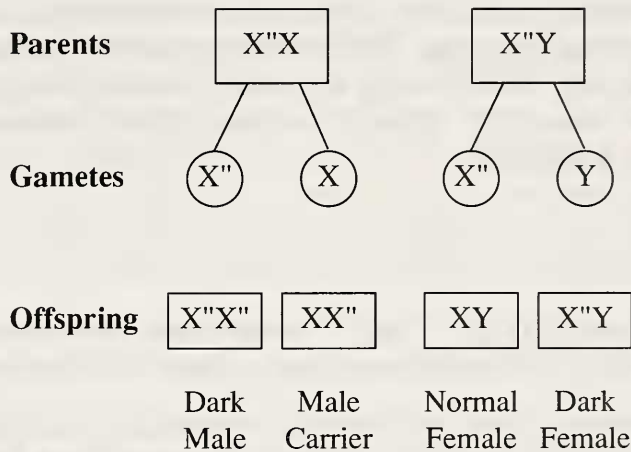
Centre: Dark variety females

Bottom: Bilateral gynandromorph mosaic, left side male heterozygote;
right side dark variety female

PLATE E

constitution X'' only. As the Y chromosome does not appear to be essential to development, the right-hand cell developed as a female, and since there was no normal X chromosome to suppress the recessive character, this was also dark.

It was disappointing that the eggs from the dark female failed to hatch, since this pairing, had the male been heterozygous, should have produced dark females, normal females, heterozygous males (carriers) and the unknown dark male, the four classes being produced in equal numbers as follows:



These results make sex-linkage the most likely explanation but the data are insufficient to exclude totally the possibility of a sex-limited situation.

The specimens shown on the plate were presented to the British Museum (Natural History) where the late D.S. Fletcher said (*in litt.*) that they were unable to match the dark females either in the British Collection or the World Collection, but that in 1967 B.J. Lempke (*Tijdschr. Ent.*, **110**: 314) had described a dark specimen approaching these, which he named *ab. nigrescens* and that his type was unique.

Acknowledgements

I should like to thank Dr Denis Owen and Dr Allister Smith for reading through this paper and for making valuable suggestions on the content.

Nephrocerus scutellatus (Macquart, 1843) (Dip.: Pipunculidae) in Surrey

A surprising total of 136 examples of *Nephrocerus scutellatus* (Macquart) was taken in two malaise traps operated by me on the embankment of the M25 motorway in Surrey during the summer of 1993. This species was

added to the British list in 1979, when a single example was taken at Kings Park Wood, Sussex, on the border with Surrey (Stubbs, 1980. *Proc. Trans. BENHS* 13: 46-48). Subsequently, it was taken at Selbourne Common, Hampshire from a rough grassland area with oak scrub. The two malaise traps on the M25 embankment thus constitute the third and fourth British localities for this nationally Endangered (Red Data Book category 1) fly. The habitat surrounding the two malaise traps is, very conveniently, similar to that at Selbourne Common – grassland with developing oak scrub, albeit that the oaks are artificially planted. A good number of the fly's congener, *N. flavicornis* (Zetterstedt, 1844) was also taken in both traps, though these were outnumbered by the “rarer” species. Several examples of *N. scutellatus* were made available to other dipterists during the 1993 annual meeting in London; the fly should now be fairly well-represented in private collections!— COLIN W. PLANT, 14 West Road, Bishops Stortford, Hertfordshire CM23 3QP.

***Hypsopygia costalis* (Fabr.) (Lep.: Pyralidae) and *Piercea vectisana* (H. & W.) (Lep.: Tortricidae) recorded in south-west Scotland**

During a family holiday at Conheath, Glencaple, Dumfries (VC72) in August 1995 a single example of *Hypsopygia costalis* was recorded on 12 August in an m.v. light trap operated in the small garden of our rented cottage. Goater (1986, *British Pyralid Moths*, p.94) gives the distribution as “England south of Durham and Lancashire”. According to Maitland Emmet, who maintains records of the British Lepidoptera for the distribution maps in *Moths and Butterflies of Great Britain and Ireland*, the only other Scottish record available is from Buckhan in Roxburghshire (VC80) published in *History of the Berwickshire Naturalists' Club* in 1992. The recent dates of these records may suggest that this moth has recently extended its range into Scotland.

An evening walk on the nearby River Nith bank on 10 August revealed several *Piercea vectisana* among the growth of sea arrow-grass *Triglochin maritima*. Bradley, Tremewan & Smith (1973, *British Tortricoid Moths*, p.40) comment that this moth is “locally common and sometimes abundant in England as far north as Cheshire, Lancashire, Westmorland and south Durham” adding that it is “Apparently unknown from Scotland”. Maitland Emmet (*pers. comm.*) tells me that this is a new record for Scotland, though the moth is recorded in the neighbouring English vice-counties.

– H.E. Beaumont, 37 Melton Green, West Melton, Rotherham, South Yorkshire, S63 6AA.